

JACG 74CE

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THE JERSEY ATARI COMPUTER GROUP

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JACG HOTLINE

534-6349

From the Editor's
Desk...

In This Issue

Although the CWA strike is resolved the Bell Labs auditorium is still not available for JACG meetings. As most of you know, the room is being taken apart so asbestos insulation can be replaced. That was supposed to have displaced us in maybe July, certainly August and probably September. The net effect of all of this uncertainty was a nervous Bill Martin and his Executive Committee. Cancel some meetings? Find alternate sites? Contact the membership in time for them to find us? How about the logistics of equipment?

Those of you who attended the June meeting know that we met at Mountain Lakes High School. I teach there and want to publicly thank the Superintendent of Schools, Dr. Michael Carey, for his expeditious approval for use of the facilities. They have proved to be more than adequate; some members said they like them better. Further, he has allowed us to continue meeting there through our September "Atari Safari" meeting which will allow us to have each presentation in a separate classroom plus show off the computer center, all Atari equipped.

Thanks also go to a local company, Turner Engineering, for providing us, without charge, a projection tv. Those of you with cable tv have seen Turner's work when they show the control rooms of CNN/CNN2. They were designed and built by Turner along with equipment for ESPN and MTBS. Turner's also have supplied us with their high school son, Patrick, (actually, he volunteered) who ably is our AV man and didn't miss a beat while controlling sound and lights during the entire meeting. Super job, Patrick!

The bottom line on this little story is that, once again, I am heartened at the response of people helping people. We thank you.

Frank Pazel

Frank Pazel
Editor-in-Chief, JACG Newsletter



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MARK YOUR CALENDARS!!

JACG Meeting Schedule

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August 9, 1986*

September 13, 1986*

October 11, 1986

*These meetings will be at
Mtn Lakes High School

MAP TO MTN LAKES HIGH SCHOOL ENCLOSED

THE VIEW FROM WHITE HOUSE.

The Presidents' message.
by Bill Martin

HOT LINE TO THE PRESIDENT. - (201) 534-6349
CREDIT WHERE DUE.

No one, including myself appears to have had any idea that the Communications Workers of America would have such an impact on us but "impact" they did. Some fast, last minute, decisions were made and an extra BIG and special "Thank You" to Frank Pazel who pulled our fat out of the fire. Frank came up with the Mountain Lakes High School where we will be having our meetings through September, 1986. He and his crew had signs up and everything organized by 8:A.M. on Saturday morning so there was absolutely no confusion. Thanks also go out to Corey Weiss who went out of his way and found an alternate meeting place at Rutgers University. We will keep it in mind for future needs Corey, thanks again. This is what the club is about and that makes me feel proud to be a member. It's like Joe Kennedy filling in for Jerry Frese who was sick. Thanks Joe, we appreciate. Case in point; just when I had given up hope of finding an attorney to push our incorporation through, along comes member Richard Semel. Now Richard is not new to the club by any stretch. Any member worth his salt that has an entire set of newsletters will tell you that Richard has been a contributing member for years! Yes, I'm telling you! Well, Richard stopped me as I was about to go up on stage and told me that he is an attorney and that he will process it for us. Simple as that. No sooner did Richard volunteer than another member, whose name, (I apologize), I didn't get, came forward to volunteer. Now I've seen response in clubs, but never like this. I'm impressed! Thank you very much.

Speaking of response, allow me to thank Oleg and the guy's down at SOFTWARE SPECTRUM. Oleg volunteered to supply a new 528ST with the RF adaptor for use during the meetings and donated three ST books for door prizes. We now can see the ST demo's on a bigger screen TV and once we get back to Bell Labs on the big screen. Thanks Oleg, we do appreciate it.

While we are on the subject of advertisers, I've had some feedback that the membership does not support advertisers, to which I say "BULL TICK!". SO (!), I'm going to ask you all to do us a big favor. From now on, whenever you patronize an advertiser, tell them, in no uncertain terms that you are a member of the JACG. I don't care if they've known you for years. They tend to forget. Let them know that YOU care about the JACG.
SUPRA CORP., IS THERE ANYONE THERE?

My recent review of the Supra (read MPP) 1200 modem left the reader with a favorable impression. Well, I've had to eat my words before so this will be nothing new. Based upon their failure to answer any of my letters, and based upon their inability to answer technical questions, (the staff member I talked to on the phone didn't even

have a schematic of the item) I must rescind my approval of the 1200AT modem. I am getting real tired of the "dump and run" style of manufacturing, because I remember when "made in America", meant something. That was back in '79 I think!!!
ATARI BBS

the new Atari BBS is called "Atari Base" and can be reached by calling (408) 745-5308. They have special SIG's for general, the ST, the XE, a dealer and a user group one for group officers. Atari has recently appointed Sandi Austin as its new user group coordinator. Welcome to the zoo Sandi!

Even though there are a few new products, for the 8 bit, starting up out there, the hand writing is on the wall. ST owners are in the minority, now, but that will change. The only advertising I've seen lately is for the ST. None of my friends will even look at an Atari 8 bit anymore. They are convinced that "CK" or the ST is the way to go, and truth is, I can't argue with them. The software is out there for the Commodore and is coming for the ST. Me, personally? I'll stick with 8 bits until I learn it. Now I did see an 620K PC clone in Byte magazine that can be fitted with a hard disk and color monitor for under \$1000, total, then, who knows?

ABE's Aces over in Allentown has a new president, Thom Geller. Congratulations and welcome to the zoo Thom! Thom had a couple of messages for us. First is that Habba Systems may be coming east in late July or August. They may put on a presentation in the Allentown area, free and give away some neat stuff like a 20meg hard disk and software. I'll put something on the Hotline as soon as Thom lets me know. He also advised us that his club seems to be having delivery and return problems with Black Patch, a mail order house in Maryland. Caveat emptor, and support our advertisers guys and gals.

Thanks to member Neal Odonel-Browne for the gift of "Compute" magazines left out for the taking at the June meeting. That's the spirit!

The mailers arrived and will be for sale at the club meetings for \$.25 each. Cheapest things I've seen around. I've used mine over and over. If you are looking for a large lot call me on the club phone before the meeting so I can bring what you need.

I know that I've forgotten some important things but it will have to wait till next month as I'm running out of space. Oh yes, J. & R. Music World of New York is now a big distributor for ATARI. They are planning an all ATARI show at Fordham College in the Bronx in August. As soon as I get details I'll put them on the HOTLINE. See you at the meeting.

GIVE A BIT!!!

Contribute to the Newsletter this month.

Reported by
Joseph S. Kennedy

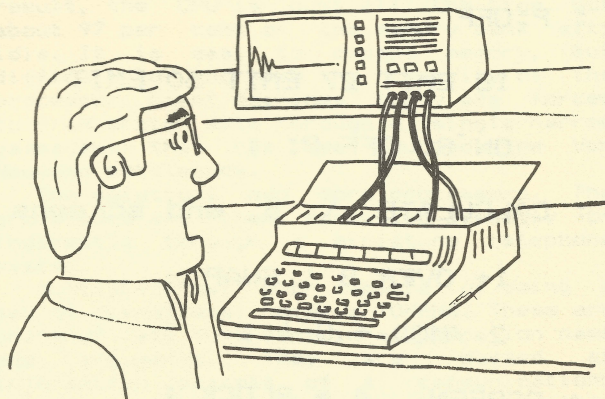
Frank Pazel formally welcomed us to the Mountain Lakes High School. He also acknowledged the assistance of Pat Turner and Pat's father's firm, Turner Engineering, in setting up the projection tv system for the meeting. Frank also played an excellent version of the song "The Things I Say" on the Atari.

In the continuing saga of what happened to the BBS Scott Brause related the last several episodes. First the board went; then Scott wiped out the 25 Megabyte hard disk and finally after getting it all set up he found a 1/4" spark in the modem - another three weeks wait for the board while Hayes repaired it. But the best news is that the board's back up and running. Give it a call and help Scott rebuild the download database. Maybe you can keep Scott busy and out of Cherry Hill.

Mark Knutsen showed us his Star Cluster program in Forth that won a science fair prize for him. Mark's program demonstrates the interaction of four stars in two planes. Mark also discussed Forth in general.

Last but not least we had a raffle of several books that were donated by Software Spectrum. Thanks again for the support Oleo.

GIVE A BIT!!

[illegible]

Printing A FORTH INDEX

by Robert Meyers - JACG

The FORTH word INDEX allows you to read the first lines of consecutive screens. This provides a convenient way of telling what is on the disk. You simply use the first line of each screen as a label of the screen's contents. For example, 42 56 INDEX will display the first lines of screens 42 through 56. You can also send the INDEXed lines to a printer. Unfortunately, the standard ways of doing this will print the index in a single column. This makes it difficult to include the hard copy in the sleeve with the disk. A disk with many screens often ends with a list 8 or 9 inches long.

This short, two-screen program solves the problem by printing the index in two columns. I usually print the index, then cut the paper to 5x5 so it will fit in the sleeve with the disk, making it easy to tell at a glance what is on the disk.

The program is written in valFORTH, which contains easy commands for accessing the printer.

The program uses two variables: B for the start screen and S for the number of the first screen in the second column. P:ON turns on the printer, changes the font to compressed (on an Epson printer) and makes the spacing 1/8th inch to squeeze in more lines. CALCULATE finds and stores the value of S and PROCESS prints the left and then the right column within a loop. Load the screens and enter b e DOUBLEINDEX to print screens b to e.

```
\ DOUBLEINDEX          16MAY86

O VARIABLE B   O VARIABLE S

: P:ON

  OFF S: ON P: 15 EMIT

  27 EMIT 48 EMIT ;

: P:OFF

  18 EMIT 27 EMIT 50 EMIT

  ON S: OFF P: ;

: CALCULATE \ b, end screens

  1+ OVER B ! SWAP -

  2 /MOD + S ! ;

: SCREEN  4 * BLOCK ;
```

```
: SEND  32 TYPE ;

: 5SPACES

  5 0 DO 32 EMIT LOOP ;

: PRINTIT \ scr num

  . SCREEN SEND ;

: PROCESS

  S @ 0 DO

    B @ I + DUP PRINTIT

  5SPACES

  B @ S @ I + + DUP

  PRINTIT CR LOOP ;

: DOUBLEINDEX \ b, end screens

P:ON CALCULATE

PROCESS P:OFF ;
```

NEW TO THE ATARI?

NEED A LITTLE HELP?

PRESS CTRL-CLEAR

SYSTEM RESET TO REBOOT

BOOT
ERROR...

##%&#!

SET OPTIONS NOW

MAYBE A JACG
BIG BROTHER CAN HELP

GIVE US A CALL
201-469-6190

Chipmunk

THE INEXPENSIVE NEW WAY TO BACK-UP
PROTECTED SOFTWARE

- is capable of working on any disk drive
- includes a copier for the Atari 800, 800XL, and 65XE computers, and a one-pass copier for the 130XE
- comes with parameters that allow you to copy protected software
- includes several useful utilities such as a program that allows you to list unlistable BASIC programs, and a utility that allows you to recover deleted files.

Microdaft
19 Harbor Drive
Lake Hopatcong, NJ 07849
(201) 663-0202



by microdaft



EASTER EGG

Helps from
Preston A.C.E.
(England)

Castle Wolfenstein: You can shoot through the sides of the screen and kill everyone that is in the aim of your gun.

Ultima II: I have noticed that sector #16 holds all a character's quality, like his gold, agility, strength, hitpoints, etc. You can edit the sector and just put in your own. I would recommend Diskey, Diskfixer, or Disk Wizard to do this. The data shows up in decimal, so it is easy to spot it.

Telengard: To raise your hit points, gold, etc. all you have to do is load in your character with any DOS compatible wordprocessor. Then, just type over the old numbers!

Jumpman: On the first board, go to the extreme right, type 54354. Then you can push the number of the board you would like to go to.

NOW IT'S YOUR TURN. Send in those hidden goodies you've discovered to the editor so all can share in the fun.

AtariWriter Plus And Epson RX80 Printer

by Terry Watkins - HACKS (CA)

Listed here are the printer control codes to enter into the printer driver editor that comes with the AtariWriter Plus word processor. The numbers you see here seem to work but are subject to correction.

Initialize every line:

Line feed and carriage return:	.....10
Underline off:	.....27,45,0
Underline on:	.....27,45,1
Backspace:	.....8
Elongate off:	.....27,87,0
Elongate on:	.....27,87,1
Bold off:	.....27,72,27,70
Bold on:	.....27,71,27,69
Type font #1:(Pica)	.....27,64
Type font #2:(Condensed)	.....15
Type font #3:(Scripts off)	.....27,84
Type font #4:(Superscript on)	.....27,83,0
Type font #5:(Subscript on)	.....27,83,1
Type font #6:(Elite)	.....27,77
Type font #7:(Italics on)	.....27,52
Type font #8:(Italics off)	.....27,53
Type font #9:(not used)	

If anyone else has created a custom
printer driver please share it.

ORBIT A Trip to the Moon ANTIC CATALOG

Reviewed by
Joseph S. Kennedy

Okay, the shuttle's grounded, the Ariane isn't flying and you don't speak Russian. Just how are you going to fulfill your dream of flying to the moon? Well first you're going to have to assemble some pretty exotic equipment - a joystick, a disk drive and an Atari 8-bit computer (48K minimum). Oh yeah, you'll also need one other thing, a copy of ORBIT: A Trip to the Moon from ANTIC (\$19.95). Your mission, if you choose to buy it, is to go into orbit; intercept a space drone and vaporize it (After all what's a computer simulation/game without a little space vaporization? God, space must be filling up with vapors!); rendezvous with the space station; travel to the moon and then land at the space base on the farside of the moon.

Once you boot up the program (40-50 seconds, seems like forever), the title screen appears. At this time you can choose to go the whole route or just practice your moon landings. This is accomplished by pressing the joystick button for the full program or the "Select" button for the lunar lander. If you select the full program the screen will show you a view of the earth, the drone space station, the space capsule and the moon (but the moon is shown only depending on the magnification you've chosen). It also displays fuel, throttle and attitude settings, life support systems and the Stick Map. From here on the simulation (because it is more simulation than game) is controlled by the joystick. The "Stick Map" appears in the lower right corner of the screen. You select an option by moving the joystick in the desired direction and pressing the joystick button. The program reads the button very quickly which becomes very frustrating at times as the selected option switches on and off rapidly creating a hit or miss situation. To change the available options, push the button while the indicator light of the map is centered. But again, be careful, the button is read quickly and the options will flash back and forth. One other gripe about the stick map is that you cannot change options while the throttle is above zero or the attitude pointers are not lined up.

Your first objective is to match-up your orbit close enough (1800 miles) to that of the drone so that you can see it on your radar screen when you activate your radar. Then, of course, blasting it out of space with your laser when you have it in your sights. To adjust your orbit you must determine what power level to set your throttle at and at what attitude of your ship to fire the throttle at. If you've got - The Right Stuff - you can do it by the seat of your pants, but the rest of us go to the Navigation mode with the joystick and let the computer help us line up orbits. After you are close enough to the drone, you activate the radar. When you

activate the radar, the view of the earth will change to your radar screen. Arm the laser and shoot the drone when you're close enough to have a good shot. Don't arm the laser too soon as it'll eat up fuel, but don't wait too long or the drone will speed by as you wait for the laser to come to full power.

After successfully destroying the drone, you must again match up your orbit but this time you match up with the space station. To dock with the space station you must be in radar mode and come within 300 miles of the station and hold that range for 15 seconds. After you dock, your ship will take on fuel and supplies for the ultimate journey - the flight to the moon. The moon is reached in the same manner as you vaporized the drone and docked with the station - that's right; match your orbit to that of the moon. There's one advantage in going for the moon as opposed to the drone and the space station, the moon is large enough that its gravity will attract your ship and of course pull you towards it when you're in the neighborhood.

Once you have achieved a stable orbit around the moon you can detach the the lunar lander and have a go at the dark side of the moon. The screen from the control panel of the lander shows you the profile of the lunar surface on top and an aerial view of the surface in the middle as well as the control gauges. The prominent features of the moon are listed as you fly over them. You must orientate the lander to come down on the base in Daedalus Crater on the farside of the moon. You must be below 22 mph when you attempt to land or else you'll crash.

As in all computer games/simulations you get a score along with vaporizing things. Here the score is determined by the time you use to complete the simulation, your landing speed and the number of times that you fire your engines, laser or use the Navigation mode. I personally could do without the scoring. If I run out of fuel or life support or crash that is enough to let me know that I need more practice on the simulator. I also could do without the drone vaporization. While you can go directly to the moon without destroying the drone, you cannot dock with the space station without vaporizing the drone.

If it were run in real time the whole program would take at least three - five days to run. In ORBIT time starts at 94 times real time and can be doubled seven times to a maximum of about 12,000 times real time. At the highest rate one day of real time takes 7.2 seconds in the simulation. In the lunar lander phase you cannot adjust the time rate which is set at 16 times normal.

As with most ANTIC programs the documentation is on the back of the disk. Here it consists of 14 pages of information and tips on how to control your orbit. After you successfully complete your mission (or even if you don't), you may not be ready for the astronaut corps but you will have a better understanding of what

space flight is all about. Even with the aforementioned complaints I would purchase ORBIT: A Trip to the Moon again and I would recommend it to anyone who feels that their Atari is a machine to help them better understand things in the real world.

GIVE A BIT!!

SELF NUMBERS

by Kenneth J. Pietrucha - JACG

This month I would like to discuss Self Numbers. The classification was discovered in 1949 by D.R.Kaprekar, the Indian mathematician mentioned last month in the discussion of "Kaprekar's Problem". Kaprekar did not refer to these numbers as Self Numbers, but rather as Self Born Numbers.

The idea of Self Born Numbers is actually one of those sum of the digits problems, where the sum of the digits are added to the original number generating a new or self born number. The process may be continued by taking the sum of the digits of the new number and adding this sum to the last new number.

We are not interested in the numbers generated, but rather those numbers which are "never born". If we consider two digit numbers, we will never see the numbers 20, 31, 42, 53, 64, 75, 86, or 97 generated. There are also twenty additional numbers less than 300 which can not be generated by the procedure previously mentioned.

The program listed below will generate a series of Self Born Numbers for every "seed" number you input. If you want to get fancy, you can put the program in a loop so that it reseeds after the Self Numbers reach a set value.

If you really want to get adventurous, try rewriting the program so it will keep track of the numbers generated and at the end of the program print out those numbers which did not generate.

This number sequence has been a favorite of mine for a long time, since it really doesn't require a computer and the numbers can be self born on a cheap calculator.

```

5  REM **SELF NUMBERS**
10  REM BY KENNETH J. PIETRUCHA
11  REM J.A.C.G.
15  REM **6-3-86**
20  GR.0
25  DIM D$(10),A$(10)
30  PRINT "ENTER STARTING
    NUMBER"
35  INPUT N
40  A$=STR$(N):L=LEN(A$)
45  FOR T=1 TO L
50    D$=A$(T,T)
55    C=VAL(D$)
60    Z=Z+C
65  NEXT T
70  M=N+Z

```

```

75  PRINT "NEW SELF NUMBER
    =" ;M
80  N=M:Z=0
85  GOTO 40

```

In analyzing the program, we see the starting number is entered in line 35. Line 40 changes the numerical value into a string variable and then measures its length for the loop.

Lines 45 thru 65 make up the loop which takes the string variable and separates it into individual string digits. The string digits are then converted back into a numeric value in line 55 and each of the numeric values is added to the sub-total Z in line 60.

When each number is added to Z and the loop is completed, the sum of the digits is added to the original starting number N and a Self Born Number M is the result in line 70.

The procedure repeats itself with the Self Born Number M becoming the number N in line 80. The program runs until you hit the break key. Have fun !

**? Have
You
Written That
Article
For The
Newsletter
Yet?**

Okimate Paper

by V. Tan - M.O.M. (NJ)

I was unhappy about the poor printout quality on my Okimate 10 printer until I found a smooth paper for both color dumps as well as text; Brother brand, plain paper. I bought 500 sheets from Consumer's Distribution catalog for only \$6.97. The results are even better than Okimate paper, which costs \$9.95 for 250 sheets.

Computer Beauty II

by Donald Forbes -- JACG

The computer -- with its gorgeous colors and fantastic graphics -- gives you great opportunities as a creative artist. But you need a few simple rules.

The idea that beauty consists of form and color is nothing new. In fact, it goes back as far as the ancient Greeks.

The Greek sculptor Polyclitus who flourished in the fifth century BC (and created a statue which set the standard for other sculptors) wrote a manual called The Canon. In it he said: "Beauty consists in the proportion not of the elements but of the parts, that is to say, of finger to finger, and of all the fingers to the palm, and of these to the forearm, and of the forearm to the upper arm, and of all parts to each other."

Much later the Greek philosopher Plotinus (205-269 AD) wrote: "The general opinion, I may say, is that it is the interrelation of parts with one another, and with the whole, together with the additional element of good color, which constitutes beauty as perceived by the eye; in other words, that beauty in visible things, as in everything else, consists of symmetry and proportion."

The importance of proportion was stressed in sculpture, but was most visible in their architecture. Buildings like the Parthenon or the temple of Apollo at Bassae seemed to be based on the "golden section," that is, the division of a line in extreme and mean ratio (a line cut so that the smaller part is to the larger as the larger is to the whole).

Plato himself went on to claim that the universe itself is built on geometrical proportions.

We can divide three-dimensional space into harmonious shapes from an origin of coordinates by making slices. The distances between the slices should follow the terms of a Fibonacci series (where each number is the sum of the two previous numbers) such as 3, 5, 8, 13, 21 and so on. We can then rearrange the boxes as we please.

Color was never a science until in 1666 a 23-year-old youngster named Isaac Newton managed with a prism to split daylight into the familiar spectrum, and then managed to recombine the colors with lenses back into white light.

There are no rules of color harmony as there are in music. The entire visible spectrum takes up less than one octave. Furthermore, there are psychological effects: a sheet of white paper appears to be white in daylight as well as under candlelight because the brain makes the necessary adjustments.

How about some rules for the use of color?

The simplest tool for the evaluation of color is the color wheel. Take a circle and cut it, like an apple pie, into six slices. Paint the top slice RED and the bottom slice GREEN. The slice (at two o'clock) next to the RED should be ORANGE and the opposite BLUE. The slice between ORANGE and GREEN should be YELLOW, and the opposite and final slice PURPLE (or mauve or violet).

Here is the general picture:

RED
PURPLE ORANGE
BLUE YELLOW
GREEN

Notice now that you have several choices of contrasts. For example, you get maximum contrast by confronting RED with GREEN, or ORANGE with BLUE, or YELLOW with PURPLE. As you know, if you stare at a RED surface too long, you get a GREEN after-image.

If you were to slice the wheel into twelve slices instead of six, then you could achieve slightly less contrast by opposing RED, not directly to GREEN, but to the colors on either side of GREEN. In other words, oppose RED to BLUE-GREEN and YELLOW-GREEN simultaneously. This is called a "split complementary" and you can start with any one of the 12 colors.

In the six-color wheel, the next level of contrast can be found by taking the three primary colors (red, blue, and yellow) or the three secondary colors (green, purple and orange).

You can have harmonious color with still less contrast by taking three colors around the six-slice wheel (or even the 12-slice wheel) such as RED, ORANGE and YELLOW, or YELLOW, GREEN and BLUE, or any of the other four choices.

Note that this mechanical scheme does not capture the whole science of color; it only serves as a starting point.

For example, there is no precise number of cycles per second which determine mathematically what the color RED should be, or how many cycles make GREEN. However, once you pick a number for RED, you can paint that color on half of a circular disk and then select a GREEN that will give a matching grey tone when the wheel is spun at high speed (what is known as "spinning to grey"). You can try it with two circular pieces of pasteboard, then cut a slice along the radius of each, merge the circles to show more RED or GREEN, and spin them.

There is no natural law that says there should be only six colors (as in the Ostwald color system). The Munsell system uses ten. You can devise your own system using more colors if you wish.

Colors also differ in intensity, or what the experts refer to as "chroma." You can have bright hues, or pastel shades, or tone down the colors by adding more and more grey. The color wheel, in effect, is really a cylinder with the pastel colors at the top, the bright colors at the center, and the greyed or blackened colors at the bottom.

Note also that you get white on your TV screen when you add RED, YELLOW and BLUE. But if you take the same colors in a child's paint box and mix them you don't get white, you get a muddy brown. In other words, some color combinations are "additive" and others "subtractive."

You can read all you want about color theory, but you will never get a feel for it until you do some experimenting on your own. In the local supermarket you can buy a box of several dozen coloring crayons for about four dollars, and a coloring book for about a dollar or so.

Spend the money, and then rearrange the crayons in the form of a circular color wheel. You will notice, first of all, that there are several yellow crayons of the same chroma (neither closer to orange or to green), but of a lighter or darker shade. There are also multiple lighter and darker blues, as well as other colors.

Pick a page in the coloring book, and then color the objects for maximum contrast (using, say, red and green) but without regard for the true colors. You are looking for contrast, not realism: color the grass red and the sky green if you want to. Now experiment on another page with some other combinations that give maximum contrast.

Next you can try using combinations with lesser contrast (but always following the rules of the color wheel). Finally, you can try minimal contrast groupings: blue, blue-purple and purple.

Note also that no color stands by itself. A color is always modified by the colors that surround it. The red in the picture looks different once you add the green. And the relative size of the colored surfaces also makes a difference. It is difficult to match pastels to bright hues. It is also difficult to remember colors: can you match the color of your housepaint in the store without a sample?

Another complication is that color depends on the texture and reflectance of the surface. The same automobile paint looks different when you use the metallic version.

Furthermore, colors change when viewed under lights of different colors. Artificial lighting also adds complexity. A tungsten filament changes color from red to orange to pale yellow as it heats up, so that incandescent light tends to yellow. Fluorescent light, however, often has a purple cast, and mercury street lights give a ghastly hue. The tie you bought under fluorescent light in the store looks different in the incandescent light in your home and in broad daylight. Smart women who want to look smart have learned to use different cosmetics for the office, the tennis court, and the cocktail party.

Once you get in the habit of looking at color, you may be tempted to try some color in your clothing instead of the conventional drab grey. Ties are a place to start. Some color ties can be horrors, and some can be pleasing. You can start your research by looking at colorful ties in a discount store. How do they stack up against the color wheel?

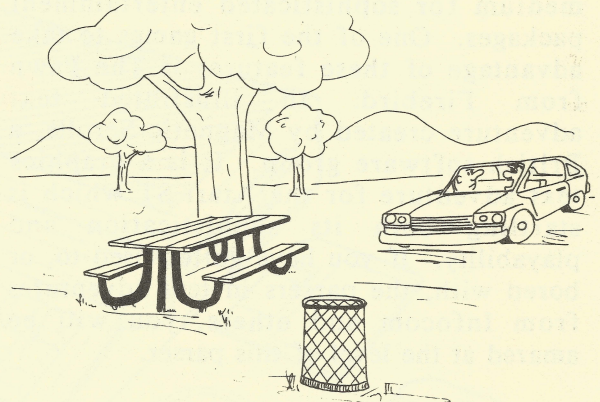
There is an old joke about the tie shopper who rejected several of the clerk's offerings with the remark: "That's a horrible tie!" When the buyer made his final choice, he noticed that the clerk put all the horrible ties into one pile. "Why are you putting them all together?" Clerk: "Oh, I sell them to the women!"

Next time you are in Brooks Brothers take a close look at their tie department. They have plenty of bright ties, but most of the horrors have been weeded out. There are no hard and fast rules for colors in men's clothing with, perhaps, the one exception that one should never mix blue and brown. No gentleman would ever wear brown shoes with a blue suit. Perhaps no gentleman ever wears brown shoes.

You may be able to find a color wheel in an art store, or perhaps even in a paint store. If you study it closely, you may gain an idea of what the old Greek philosopher had in mind almost two thousand years ago.

You now rank as an expert (99th percentile) in the use of harmonious form. You can also consider yourself an expert (you know more than 99 per cent of the population does) in the mechanics of color. But how do you fit form and color together? Think about it. What is your answer?

We will have a simple answer for you next time. But you will never in a million years be able to guess what it is.



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The Pawn

**Reviewed By
Arthur Leyenberger**

Copyright (c) 1986
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Stunning sound and graphics coupled with super-fast hardware and plenty of memory make the Atari ST a perfect medium for sophisticated entertainment packages. One of the first games to take advantage of these features is The Pawn from Firebird: an illustrated text adventure created by Magnetic Scrolls, a British software group. It is a graphics text adventure for the Atari ST which is startling both its sophistication and playability. If you have gotten used to, or bored with, the parsers in text adventures from Infocom and others, you will be amazed at the level of this parser.

It seems that you have just awakened in the mythical land of Kerovnia with a mysterious wristband clamped to your forearm and no knowledge of how it, or you, got there. You are not the only one with troubles though, as the King of Kerovnia is losing the loyalty of his subjects. The royal experts attribute this loss of devotion to King Erik's refusal to reinstate citizenship to the Roobikyoub dwarves, who were thought to be the instigators of the assassination of Queen Jendah II. The dwarves were banished by Erik, but the true facts of the assassination were never discovered.

Kerovnia's economy once thrived as a result of the dwarves's production of the strongest malt whiskey this side of Obakanga. But vested interests are now at work to prevent the return of the dwarves. These forces have gone as far as to form the Farthington Real Ale company which produces a refreshing spring water, at least as good as Perrier.

The land of Kerovnia is somewhere in the middle of nowhere, which makes sense within the context of the game. The object of the game is to find a way to

remove a wristband that, while attached to your hand, prevents you from leaving the country. It is imperative that you leave the land of Kerovnia as soon as possible.

The parser is especially unique in its handling of objects. Objects may be referenced by location as well as name. For example if you were to type "plant pot plant in plant pot" the program would acknowledge with "the plant is much happier now". As a result of the powerful parser, complex sentences can be entered to let you interact realistically with the The Pawn's characters and objects.

Another attractive features of the game is that pull down menus, in the shape of scrolls, are used to issue commands. In addition, when you pull down on the top of the screen, a low-resolution color picture is pulled down on top of your medium resolution text screen. The effect is much like that of pulling down a window shade. This particular technique is one of the hallmarks of the Amiga computer and seeing it done on the Atari ST just reinforces the view that the ST is truly a remarkable machine.

The Pawn is a project that has spanned more than a year. It's quality, humor, imaginative game play and stunning graphics are all evident. The entire game is written in machine code rather than C or Pascal so it runs faster than products that most text adventurers are used to. The graphics are dazzling, the plot is rich and the implementation is top notch. The Pawn is available now so go buy a copy before you wake up and discover a wristband on your forearm.

The Pawn

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**Either monochrome or RGB monitor
(TOS on ROM is helpful)**

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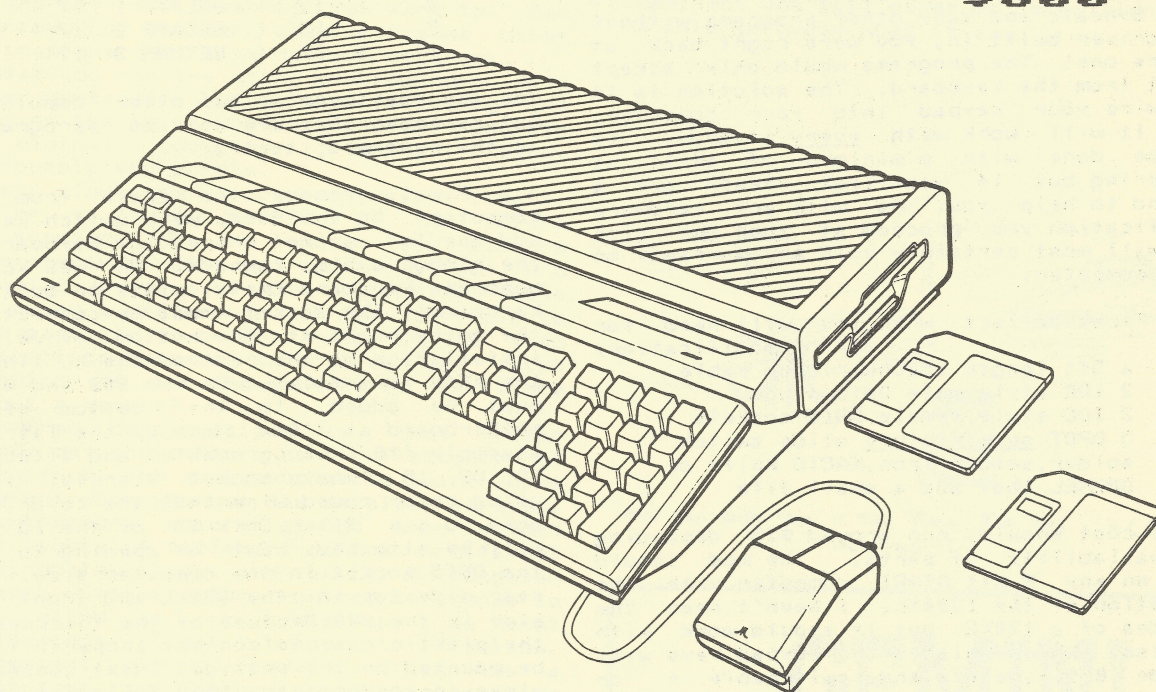
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TECHNICAL DATA:

- MC68000 microprocessor; 32-bit internal, 16-bit external architecture.
- Clock speed 8 MHz.

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HARDWIRE YOUR KEYPAD

by R.P. Mulhearn Jr. - JACG

Seeing the Atari Keypad on sale for \$10.00 in Computer Shopper, at your local club or computer show, you couldn't resist. Just the item needed for Synalc or entering those tax or budget records. You got it home and found you needed a driver to make it work. Your local club and Atari support publications came to your rescue. After typing in or loading the driver program, your keypad worked! But after trying it with Synalc and many other programs without the driver built in, you were right back at square one! The programs would only accept input from the keyboard. The solution is to hardwire your keypad into your computer, then it will work with every program. It can be done with a minimum of skill at soldering but if you feel uneasy get a friend to help you. As with any hardware modification you proceed at your own risk and will most certainly void any warranty on your computer.

First collect what you will need for your modification:

- a 5ft length 15cond.ribbon cable
- 2 IDC style male DB15 plugs
- 2 IDC style female DB15 sockets
- 5 DPDT subminiature slide switch
- solder,solder iron,XACTO knife or DREMEL tool and a small file

Total cost should run around \$25 depending on availability of parts. The mod should work on any 8 bit ATARI computer with the exception of the 1200XL. I havn't seen the insides of a 130XE but it should work with it also. When finished the keypad keys will become 0-9,-,delete,and switchable + or return,. or , ,esc or *,N or /,and Y or =.

First, a bit on how and why it works so if you wish you can hardwire different key combinations. Atari in their wisdom made the various keyboards of the 8 bit line virtually interchangeable with the exception of the 1200XL. The pin numbers in the following table refer to the pin number on the keyboard interconnect ribbon or socket on the 800 and 800XL. It should be virtually identical on the 400,600,800X1,65XE and 130XE(check with an ohmmeter if in doubt; a pressed key shows zero ohms between the two pins.)

PIN #	800 J106	FUNCTION
	800XL J8	
1	ibreak,7,8,9,0,<,>,delet	
2	!esc,1,2,3,4,5,6	
3	!u,i,o,p,-,=,return	
4	!tab,q,w,e,r,t,y	
5	!j,k,l,;,+,*,ctrl	
6	!a,s,d,f,g,h,caps lowr	
7	!n,m,,,./,inv,space	
8	!shift,z,x,c,v,b	
10	!6,7,y,u,n,	
11	!h,j,space	
12	!5,8,t,i,o,g,k,b,m	
13	!4,9,r,o,f,l,v	
14	!3,0,e,p,d,;,c,.	
15	!2,<,w,-,s,t,x,/	
16	!1,>,q,=,a,*,z,inv	
17	!esc,delete,tab,return,caps	

Therefore, according to the above table for our mod the following pin combinations give us the resulting key pressed.

KEY	PINS	KEY	PINS
0	1 14	.	7 14
1	2 16	+	5 15
2	2 15	*	5 16
3	2 14	/	7 15
4	2 13	=	3 16
5	2 12	,	7 13
6	2 10	Y	4 10
7	1 10	N	7 10
8	1 12	DELETE	1 17
9	1 13	ESCAPE	2 17
-	3 15	RETURN	3 17

You may use these or any other combinations but remember they are only as reprogrammable as the Keyboard itself.

First, remove the cover from your computer. On the 800XL with switch keyboard add the 1st socket where the keyboard and the ribbon cable connect. On 800 XL with membrane keyboard (metal plate on bottom of keyboard), the socket must be connected to the motherboard at the bottom of J8. The installation on the rest of the XL line and the XE's is similar. On the 800 and 400 it must be added to the bottom of the motherboard at J106. Make up the 1st socket assembly (10 in long cable) and attach the IDC DB 15 female socket (careful if not using color coded wire that the color stripe goes to pin #1). Only 13 of the 15 wires will be attached. Cut an opening to mount the DB15 socket in the computer side. Right rear side top in the 800XL and front right side in the 800.Because of the thickness of the plastic case,to connect properly it must be mounted on the outside. Next connect the wires according to the following table. Note that the DB 15 socket is numbered right to left top continuing left to right bottom as viewed from the front. Pin 1 on J106 on the 800 is located on the bottom of the motherboard near port 2.On the motherboard of the 800XL locate J8;pin 1 is marked on the silkscreen. Pin 1 on the 800XL switch assembly is the rearmost connection where the ribbon cable connects.

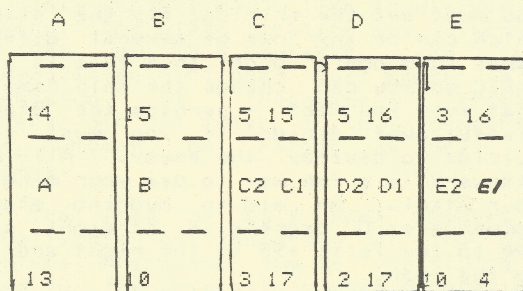
DB15 PIN	COMPUTER
1	1
2	2
3	3
4	4
5	5
6	no connection
7	7
8	16
9	17
10	10
11	no connection
12	12
13	13
14	14
15	15

Reassemble your computer,all remaining work will be done on the keypad itself.

Disassemble your keypad(note if you have a membrane type keypad you are on your own) Remove the key assembly and put it aside for now. In the upper case mount the

other DB15 female cable assembly (8 in long) rear center about 3/4 in below the top edge. The five subminiature switches (DPDT 1/4" W x 3/4" L) mount conveniently in the bottom section rear right or left. Be careful to mount the switches next to each other there is no extra space! Next desolder the switches from the PC board and discard the board. (note as an alternate you can cut traces to dematrix the switches.) Wire the switches and key assembly according to the following diagrams.

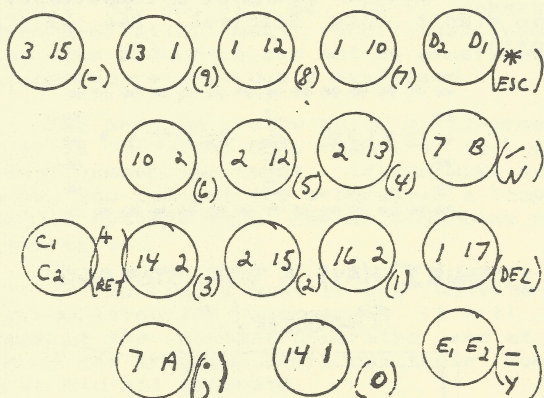
Subminiature switches as viewed from rear when mounted.



FUNCTION

. / + * =
 , N RET ESC Y

Keypad switches (as viewed upside-down) and (key function)



Use the remaining length of ribbon cable to connect the two male DB15 plugs. Now to check it out, connect an ohmmeter or a simple continuity checker made out of a battery and bulb to the pins on the male DB15 plug according to the key pressed and female DB15 connection tables. Plug the other end into the socket on the Keypad. For example Key 9 is pins 1 and 13 which on the male DB15 are pins 1 and 13, while delete is pins 1 and 9 on the DB15 male and return is switch C down and pins 3 and 9 on the DB15 connector. When the key is pressed you should show continuity. Repeat for all other keys one at a time. Find and correct any mistakes as found before proceeding. **NOTE** that the switches A thru E must be in the correct position when the Y, N, ESC, RET, and . keys are pressed. If everything checks out plug the connecting cable into the computer and never have to load a keypad handler again.

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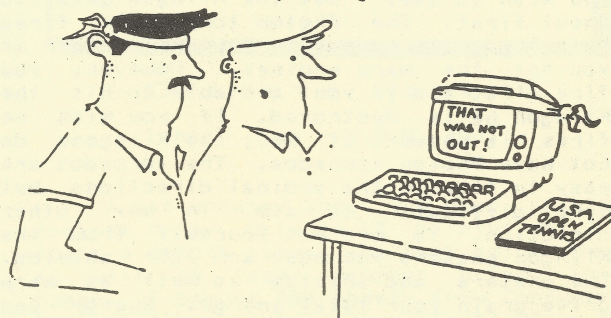
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***** FLEA MARKET RULES *****

In order to clarify the intention of the Executive Committee in sanctioning the use of the BTL lobby before and after monthly meetings for use as a member flea market we publish the following rules:

1. All flea market sellers must be current JACG members.
2. Space is provided on a first-come, first-served basis.
3. Only ORIGINAL programs with ORIGINAL documentation may be sold in the area of software.
4. Hardware of any type may be sold normally without constraint. The Executive Committee reserves the right, however, to limit the physical size and space consumed by such hardware.
5. Flea market business will be conducted only in the lobby and ONLY when the meeting is not in session in the auditorium.
6. The Executive Committee reserves the right to deny or suspend the privilege of flea market usage to any person, member or not, for infraction of these operating rules.



'... it even questions it's own line decisions.'

The Australian Atari Gazette
(Melbourne)

by Joseph S. Kennedy

Those of you who attend the meetings know that for the past several months we have had demos of many of those golden oldies from the early days of home computing - you know way back in '80, '81 and '82. Well this month I thought that I'd look at some of the golden oldies in our public domain library.

The first program that we'll look at is on Volume #001 - Games #001 - can't get any moldier or older than that!! The program is that mainstay of computers, Star Trek. Here you assume the role of Commander Kirk with the mission to destroy a certain number of Klingon vessels within a specified number of stardates. The battle takes place in a galaxy that is divided into 64 quadrants laid out on an 8x8 grid. Each quadrant also has 64 sectors again laid out on an 8x8 grid.

With your short range sensor you can view one quadrant. Within the quadrant you will see the Enterprise. You might also see Klingon vessels, starbases or stars. Don't fly into a star, it's not healthy for the Enterprise. The graphics are all basic Atari graphics but they are worth looking at because they are well used for this program. Flying the Enterprise is accomplished setting a course from 1 to <9. A course setting of 1 is due east; 3, north; 5, west; and 7, south. A value of 9 is undefined but values may approach 9. Speed is set in warp values with one warp unit equal to one quadrant in length.

In addition to the short range sensor you also have a long range sensor that shows the condition of each quadrant that is adjacent to a quadrant that you in. Each quadrant shown has a three digit number. The first digit is the number of Klingons in the quadrant; the second, the number of starbases; and the third the number of stars. You also have a galactic report which is very similar to the long range sensor but shows all quadrants that have been revealed by the long range sensors. Thus the galactic report is very bare at the beginning of the mission.

You have two weapons at your disposal - Phasers and Photon torpedos. The phasers are fired by indicating the amount of power you wish to use. But the Klingon gets to shoot first. The Photon torpedo is fired by setting its course in the same manner as you set the warp engines. However, you fire first and if you are able to hit the Klingon he is destroyed. If you miss he fires his phasers at you; the Klingons do not have Photon torpedos. The torpedos are easy to fire in the ordinal directions but very difficult to aim in any other direction. To protect yourself from the Klingon phasers you must arm your shields. The phasers and shields as well as warp drive drain your total energy. Energy can be replenished by visiting a starbase. I find that I still enjoy a good game of Star Trek. Give her full warp drive Mr.

Sulu we're off to conquer the Klingon Empire but be careful not to hit the break key, it's not disabled.

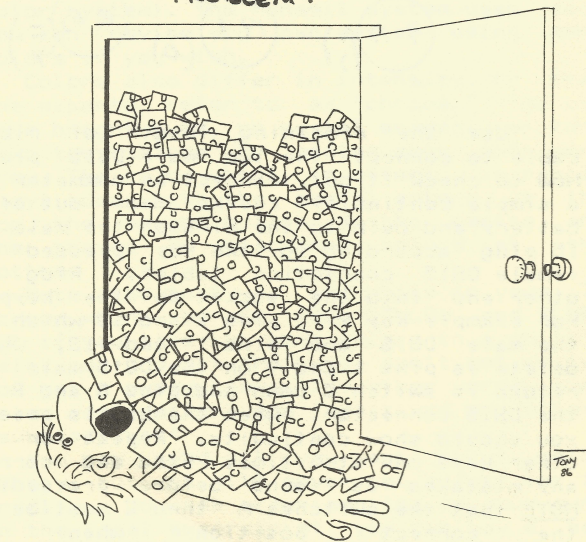
The next game is also a variety of Star Trek called Starwarp and is found on Volume #002 - Games #002. Starwarp must be a precursor to the Infocom ads that say the graphics are all vivid and all in your mind. Starwarp is a text game that requires you to visualize the enemy in space then decide which weapon to use against him.

Your weapons include phasers, torpedos and probes. Each weapon has its own range and most effective distance. In addition you must set the shields; fly the starship which can be any one of several different names (and don't forget that this is all in BASIC so you can change the ship names to what ever you want - perhaps the Starship Fluffy) even decide if you must commit suicide to destroy the enemy. All-in-all Starwarp is a fun way to use your mind and your Atari. An aid to budding starship commanders: 0 degrees is straight ahead; -90 to the left; +90 to the right and +180 to the rear.

Well, I think I've gone on enough for this month. I apologize to the non-Trekkies in the membership if you're reading this far but try these games you might find a reason to like Star Trek and the price is certainly right. Since I don't believe in absolutes I feel that there must be one Non-Trekkie in the group but then whoever heard of a computer person who didn't like Star Trek. See ya' next month.

```
*****
*           J           *
* GIVE A BIT!! *
*           C           *
*           G           *
*****
```

"I THINK I HAVE A DISK STORAGE
PROBLEM!"



NOISE from NOYES

The AVATEX modem
The answer to your dreams,
or a nightmare?

by Dave Noyes -JACC

On April 15th of this year (I remember the date because it had some other significance which escapes me now) I decided that enough was enough; it was high time to shake off the coils of the 300 baud world and blast off into the world of 1200 baud. Having laid out 79 big ones for my MPP 1000E a few months ago; I decided (what the heck) to throw all caution to the wind, dig deep into my pockets, and put \$99.00 into a 300/1200 baud modem. Big spender, huh? Well, I've seen them for as low as \$89.00! What is it? It is the AVATEX 1200 modem.

What is the AVATEX 1200? It is (as the name implies) a 300/1200 baud RS 232 (yes you will need an interface) modem. It is powered by an external power supply (included, of course), and has 8 DIP switches for test and custom purposes. It responds to most well-known "AT" commands. It works with both AMODEM 7.2 & 7.22 and 850 EXPRESS 1.0 & 1.1 (100%!). It will probably work just as well with other terminal software, it just so happens that these are the ones that I primarily use.

What isn't the AVATEX 1200? It is not HAYES compatible. It does not support the entire range of "AT" commands. It does not handle the "S" register (whatever that is). It also is not expensive.

What will it do? Everything that I want it to. Access BBS's. Upload and Download. Access the services (DELPHI, COMPUERVE, GENIE, DOW JONES, etc.) I've even used it with VT10 Squared to access my Company's micro (and work with UNIX).

When I first bought the AVATEX, I was so impressed that I "plugged" it on a few local BBS's. Owners of HAYES, PROMETHEUS, et. al. told me in no uncertain terms how such a "cheap" product couldn't hold a candle to theirs (I agree in one respect--it couldn't hold a candle to the outrageous prices they paid!). I was told there was a problem with "line noise" (whatever that means--as I've said before, the AVATEX has done EVERYTHING that I have wanted and expected of it). I was curious, however, and called E+E DataComm (the manufacturer) and asked them about this. They told me that they tested their AVATEX against the competition and had it running with line noise that would have rendered the competition useless. I was also told, that for the purists who wanted something 100% HAYES compatible (down to the DIP switches, and including the "S" register whatever), they are coming out with the AVATEX 1200 HC (for "HAYES Compatible") sometime around the end of June, and it will LIST for approximately \$50.00 more than the AVATEX 1200. They added that they expect to come out with a 2400 baud modem some time after the first of the year (1987).

The AVATEX is a definite "10" in my

book--take the plunge (if you haven't already) to 1200 baud--inexpensively!

***Next in NOISE from NOYES:
Mid-year thoughts, or
Where to, Ye 8-bit?

Checker Can't Spell Reader

Dear Editor of
InformationWEEK:

I thought ewe mite bee interested in a revue of a currant hot software product witch is used fore finding spelling errors in word processing text.

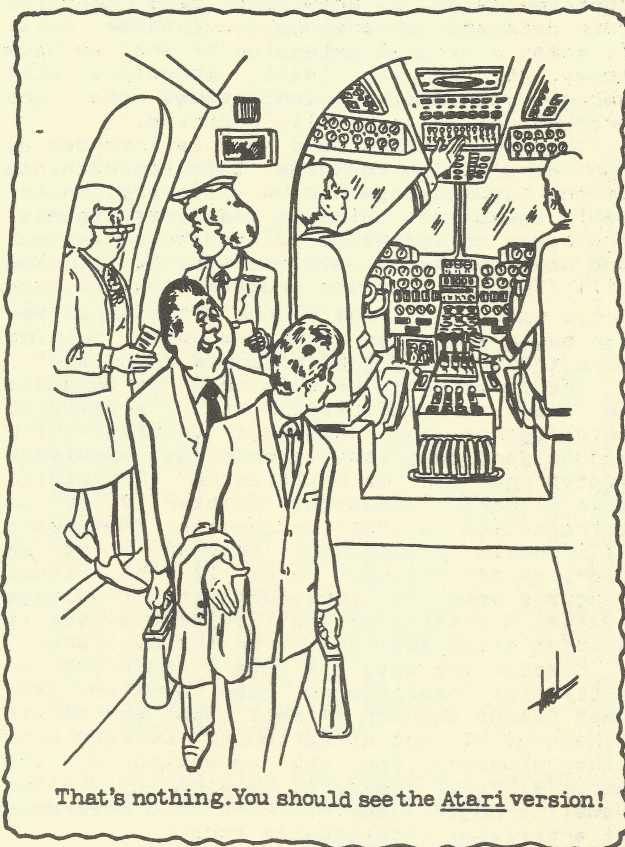
I halve bin using won four quite a wile and found it too bee invaluable. I have bin trying two improve my spelling for sum time now since my secretary always commented that it isn't to grate.

Weather I like it or knot, I no I cud right bettor if I wood practise moor, and widdh the spelling checker too help me it will bee easier two fined my mistakes.

Awl I can say is that a spelling checker is such a terrific program that every business cud fair bettor if they wood use won.

The spelling checker I'm using is such a good program it has maid me interested in the vendors' grammar checker, witch I will bee testing next. I will send yew a revue of that program two.

Constant Reader.



The Atari Journal
D.A.U.G. (FL)

Your Own Expert System

by Donald Forbes -- JACB

CUSTOMER: "Here at Dalton's bookstore you have the largest selection of computer books in downtown New York. Do you happen to have a copy of Tab Books 258-page \$19 book called Designing and Programming Personal Expert Systems by Carl Townsend and Dennis Feucht?" BOOKSTORE CLERK: "I can't keep that book on the shelves! They go out as soon as they come in! Give me your number...I'll call you."

If you now own a 520ST with color (they are going for \$759) and are waiting for Jack Tramiel's IBM-compatibility box, this is your book.

Atari, as you know, exhibited this spring at the opening of the Hannover Fair in West Germany its IBM PC compatibility box for its 520St and 1040St computers. The box has its own 8088 8-bit chip, a socket for an 8087 math coprocessor chip, and 512K bytes of RAM. It connects to the ST via the DMA port. Because introduction is still a few months away, Atari cites their high-volume low-cost policy when asked about prices.

So, if you want to catch up on today's hottest computer topic -- artificial intelligence and expert systems -- while you wait, here is a chapter-by-chapter rundown of the book.

The introduction quotes computer expert John Diebold: "The coming age of artificial intelligence is expected to impact jobs of white-collar workers the way industrial automation altered the blue-collar ranks." And it cites guru James Martin: "A database contains data; a knowledge base contains both data and assertions about those data. It seems a natural extension of what we have today. At the very least, computers will become interactive consultants to the professions -- especially medicine."

The book, the authors say, is intended as "an introduction to these thinking machines of the future. Together we will explore the basic ideas of thinking and intelligence, the basic components of a knowledge system, and how knowledge systems are built. You will find the complete program listings here for a small knowledge system with which you can begin your own adventure using nothing more than your home or business computer."

The first part of this book is intended as an introduction to artificial intelligence and knowledge systems. The second part describes a complete knowledge system that can be built using the (public domain) Forth language. Chapter 7 is an introduction to list processing, the heart of symbolic processing. Chapter 9 is an overview of Prolog, which is the actual language used to implement the knowledge system. A listing of the knowledge system is also on disks available from the publisher.

Chapter one says the modern beginning of artificial intelligence goes back to 1956 when Claude Shannon of Bell Labs and Marvin Minsky of MIT met at Dartmouth College with other pioneers for the unveiling of the world's first expert system -- Allen Newell's Logic Theorist. Here is a breakdown of artificial intelligence today:

Artificial Intelligence

- Knowledge representation
 - Rule based systems
 - Semantic nets
 - Predicate calculus
- Problem solving
- Knowledge systems
 - Productions
 - Frames
- Natural language interfacing
 - Machine translation
 - Document generation
 - Computer interfacing
- Learning
- Cognitive modeling
- Robotics
 - Sensors
 - Control devices
 - Environmental problem solving

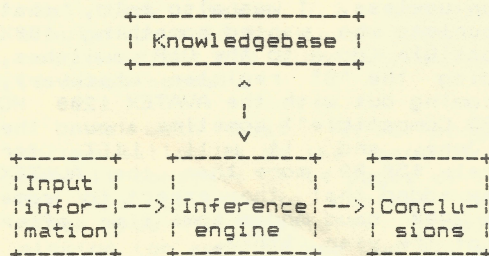
Expert and knowledge systems are a class of computer programs that advise, analyze, categorize, consult, and diagnose. They address problems that normally require the expertise of a human specialist. Unlike computer programs that use procedural analysis to solve problems, expert systems attempt to solve problems in specified domains (specific fields of expertise) using deductive reasoning. Such systems are often capable of solving problems that are unstructured and poorly defined.

They cope with the lack of structure through the use of HEURISTICS, which are rules of thumb that can be used to solve a problem when lack of knowledge or time prevents a more complete analysis. Knowledge systems are the primary subject of this book.

Digital Equipment Corp. uses expert systems to configure systems for new customers, saving \$200,000 a month. PROSPECTOR, another expert system, has located a molybdenum deposit worth \$100 million that none of the nine experts who helped build the knowledgebase had been able to find. MYCIN does medical diagnosis that is comparable to the expert.

One example of how artificial intelligence techniques will influence personal computer software is ANSA's new database manager called PARADOX. This program is not marketed as a knowledge system, but rather uses artificial intelligence techniques to control a hidden agenda. Using this approach, PARADOX can easily be used by someone without database, programming, or knowledge engineering experience to solve knowledge problems. The user defines the data retrieval problem by given examples, and PARADOX then uses heuristics to write its own procedure to solve the problem.

Chapter two sketches the parts of a knowledge system:



Here are some of the advantages over a human:

1. Is not biased.
2. Does not jump to conclusions.
3. Applies a systematic process, considering all details, often working to the best possible alternative.
4. Can be very large. A medical doctor has a limited memory and can forget. A rural doctor may never have seen a specific disease. Knowledge in a computerized system is always accessible.
5. Knowledge systems are not 'noisy.' A human expert can be swayed by outside influences, but a computer system has no knowledge outside the domain of interest.

Here are some possible applications for a knowledge system on a PC: calculating postage based on weight and destination; finding lowest cost phone services; auto repair diagnosis; configuring small computer systems for a customer; local weather forecasting; security systems; solar heating systems; analyze trip reports for corporate deductions; and personal investment strategies.

Computers today are adept at numeric processing. The human mind, in contrast, is far more adept at the processing of symbols than even the best computers. The development of expert systems is an attempt to develop symbolic processing capability that humans use to solve problems on the computer to equal the expert within a limited domain.

Chapter three discusses a particular type of knowledge system called a "production system." It could also be called a "rule-based system," or a "pattern matching inference system." The classic computer system is a series of procedural steps. The production system, in contrast, has almost no procedural component and is mostly data-driven or descriptive.

A production system consists of three key components: the rulebase, the working memory, and the inference engine. The rulebase uses rules defined by IF, AND, THEN and OR. The memory or database contains a set of facts. The inference engine combines the rules and facts to arrive at conclusions. For example: IF a white car is easy to see at night AND Jack's car is white CONCLUSION Jack's car is easy to see at night.

Chapter four discusses alternative ways of representing knowledge: using slots or frames, using semantic networks, or representation by example.

Chapter five is an introduction to knowledge engineering. There are three steps that are needed to construct the knowledgebase from the knowledge of the expert: (1) defining the domain; (2) defining the representation and representational theory; and (3) acquiring the knowledge. The knowledge engineer should avoid approaching the expert with an IF-THEN type of dialog. A better alternative is to build a prototype or model of the domain.

Chapter six describes the Forth language and operating system, which is then used in chapter seven to create a series of list-processing words patterned after the LISP list-processor language. The authors chose to simulate LISP in Forth for several reasons. Both are extensible in that new functions can be defined. Both are oriented

to function calls. Identifiers are variables in the Forth dictionary (a statically allocated list). Both are naturally recursive. Both have a simple syntax. Both are small languages (need little memory). Both are "language systems," not just languages. Both are very interactive and appeal to hackers. [Give me a blank disk if you want the Laxen & Perry Forth.]

A list is a string of characters. Every list consists of HEAD (the first item on the list) and TAIL (the remainder of the list, with NIL at its end). Once you separate HEAD and TAIL, then TAIL becomes a new list with its own HEAD and TAIL (with NIL at its end). Recursion and iteration are the primary tools for processing lists.

Chapter nine is an overview of Prolog (programming in logic), which is the actual language used to implement the knowledge system used as the example for the book. Prolog emerged in the 1970s from France and Scotland and has been chosen for the Japanese fifth-generation computer project.

Unlike the other languages we know, Prolog is RELATIONAL or DECLARATIVE, rather than FUNCTIONAL (which takes arguments, processes them, and returns a result). A RELATIONAL language program consists of statements which describe the relationships among the things presented. The statements present facts, which are either true or false. The following statement declares the fact that a goat is a mammal:

mammal(goat)

The facts that Carl is the father of Sam, and Sam is the father of Lewis are written in Prolog as:

father(carl,sam)
father(sam,lewis)

If you then define the rule:

grandfather(X,Z) if father(X,Y)
and father(Y,Z)

then Prolog (using multiple backward and forward searches of the knowledgebase) will return one or more correct answers (or "no answer") or, in this case:

grandfather(carl,lewis)

Chapter ten discusses some advanced features of Prolog as well as parallel computation. Most of the computers built in the past 40 years were designed to do one thing at a time. Following the basic concept conceived by John von Neumann and his colleagues in 1945, they consist of a single, high-speed central processing unit connected to an array of memory cells. As a result, the CPU is busy all the time but about 97 per cent of the memory bank sits idle. It is easy to expand memory, but difficult to increase the capacity of the processor. Giant machines today are forced to draw their data through a single narrow passageway that has been dubbed the Von Neumann bottleneck.

The solution: add more processors. The processors are then connected directly or indirectly through a miniature telephone system.

Multiple CPUs, each capable of doing a set of operations, receive TOKENS. These are units of data that contain an operation name and arguments. They are passed as information packets of a communications network, with "envelopes" that identify

If you want to be the expert on expert systems, you can spend \$3000 tomorrow and buy GURU for the hard-disk IBM PC or clone on your desk at the office. If don't have all that money and hardware, and want to practice at home with public domain software, then this book will show you how to get ready for the day when Jack Tramiel delivers his magic box.

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